



# The dilemma of polypharmacy

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The prevalence of chronic diseases, for which one or more medicines may be indicated, increases with age. Polypharmacy is usually defined as the use of five or more drugs, including prescribed, over-the-counter, and complementary medicines. It may be a useful prompt for medication review, as it is associated with problems of medication management and suboptimal prescribing. However, polypharmacy is not a clinically useful independent marker of the quality use of medicines. The type and dose of medications rather than the number of medications determine meaningful clinical outcomes.<sup>1</sup>

The more drugs a patient takes, the harder it may be to obtain an accurate medication history, which impedes informed medication review and prescribing. The incidence of adverse drug reactions increases with the number of medications used. Polypharmacy is a barrier to adherence because of the associated complex medication regimens, increased risk of adverse drug events and high medication costs. Poor adherence contributes to the increased risk of medication errors seen with polypharmacy.

### In this issue...

Treatments should be safe and effective, but our assessment of safety and efficacy depends on understanding the outcomes of studies. Ian Scott therefore explains how to interpret the results of clinical trials.

When the findings of clinical trials are adopted into practice, they can result in some patients being prescribed multiple drugs. As polypharmacy is sometimes considered to be less than optimal prescribing, Sarah Hilmer explores the dilemma.

Another dilemma is whether chemotherapy causes cognitive impairment. Janette Vardy discusses the evidence.

There is evidence for the effectiveness of proton pump inhibitors, but Sam Al-Sohaily and Anne Duggan remind us what to consider before prescribing these drugs for long-term use.

Polypharmacy is associated with suboptimal prescribing. The more drugs a patient is exposed to, the more likely they are to be prescribed inappropriately.<sup>2</sup> 'Potentially inappropriate medications' in the elderly include those with sedative or anticholinergic effects and long-acting non-steroidal anti-inflammatory drugs.<sup>3</sup> Polypharmacy may occur when additional drugs are prescribed to treat the adverse effects of other drugs. This is known as the 'prescribing cascade'.<sup>4</sup> Other suboptimal prescribing associated with polypharmacy includes prescription of more than one drug in the same class or prescription of a drug that interacts with or is contraindicated in combination with another of the patient's medicines. Ironically, in a study of older patients the probability of under-prescribing – defined as lack of an indicated drug when no reason could be found for not prescribing it – also increased significantly with the number of drugs prescribed.<sup>5</sup>

The risk of falls is increased with polypharmacy. This association is partly due to the chronic diseases for which the multiple medications are prescribed.<sup>6</sup> With polypharmacy, the increased use of specific classes of drugs, especially centrally acting and cardiovascular medications, is also likely to be a factor in increasing the risk of falls.<sup>7</sup>

The key issue is whether each drug has been prescribed appropriately, both individually and in the context of the patient's total medication exposure, risk of drug interactions, comorbidities, physiology and quality of life. Some drugs, particularly those with anticholinergic and sedative effects, impair physical and cognitive function in older people. The more drugs with these effects that patients are exposed to, in number and in dose, the poorer the patients' overall function. A tool such as the drug burden index<sup>1</sup>, which measures the patient's total exposure to anticholinergic and sedative medications using the principles of dose-response, provides a better indication of the risks of suboptimal prescribing than simply counting drugs.

There are several conditions in which the combined use of several drugs may be beneficial, appropriate, and advocated through evidence-based guidelines.<sup>8</sup> For example, primary prevention of macrovascular disease in diabetes may require one or more oral hypoglycaemics and/or insulin, one or more antihypertensives, lipid-lowering therapy, and aspirin. It is not clear how to apply treatment guidelines to frail older people with multiple comorbidities, because the evidence that supports them was not obtained from this population. Application of

published guidelines to a hypothetical 79-year-old woman with chronic obstructive pulmonary disease, type 2 diabetes, osteoporosis, hypertension and osteoarthritis led to recommendations for 12 medications, with high risks of interactions and adverse reactions.<sup>9</sup>

When prescribing for a frail older patient, co-ordinate prescribing with others involved in the patient's care and, if possible, aim for one prescriber per patient. Medications should be reviewed regularly with respect to the indication, therapeutic aims, dose, efficacy and safety. Consulting with a pharmacist for a home medication review may improve clinical outcomes.<sup>10</sup> The benefits and risks of treatment, including the overall impact on function and quality of life, should be discussed with the patient and/or their carer. The time required to achieve outcomes relative to the patient's life expectancy should be taken into account.

This clinical judgement approach contrasts starkly with the proposal to prescribe everyone over the age of 55 a 'polypill' for primary prevention of cardiovascular disease.<sup>11</sup> The polypill contains a lipid-lowering drug, three blood pressure-lowering drugs, aspirin and folic acid. Comorbidities, co-medications and age-related changes in pharmacokinetics and pharmacodynamics are not considered with this strategy.

Prescribing and managing multiple medications appropriately and effectively is important to optimise function and to avoid adverse health outcomes, especially in older patients. The overall effect of a person's medicines is like the sound of a group of musicians. A listener's perception of beautiful music does not depend on the size of the group, but on the quality and combination of the players, carefully selected and managed by the conductor, and tailored to the musical tastes of the specific audience.

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*Conflict of interest: Dr Hilmer holds a patent for the drug burden index with Drs Abernethy and Mager.*

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### Prescribing exercise for diabetes

Editor, – In the article 'Prescribing exercise for diabetes' (*Aust Prescr* 2007;30:130–3), the author adequately takes into account cardiovascular and neurological concerns when advising, for example, jogging or running. However, relative adult weight gain (weight gain compared to weight on reaching maximum height and general maturity) is

seemingly not addressed other than in very general terms. Patients may be at risk of considerable irreversible weight-bearing joint damage if this issue is neglected, since even prolonged walks in obese individuals could result in aggravated ankle, knee and hip degeneration due to the load-bearing involved.